

ence for one of the two forms, assimilating or destroying it, whilst the other form is rejected. Whilst the same seems to be true in the case of the higher animals, the experiments as yet made are somewhat uncertain. In the present paper Mr. Bruni deals with the differences shown by the right- and left-handed forms of camphor. The latter was found in a large number of experiments to be about thirteen times as poisonous as the former when injected into the circulation of rabbits or guinea-pigs. The *lævo* form also differs strikingly from the *dextro* form in being practically tasteless; a somewhat similar difference has already been recorded for the two asparagines, the *dextro* form being sweet, the *lævo* form tasteless.

THE *Revue scientifique* for September 19 contains a lecture delivered by Sir William Ramsay to the French Association for the Advancement of Science during the meeting at Clermont-Ferrand. In this lecture a full account of the discovery of the inactive gases of the air is given in popular language. The relation of the radium emanation to these gases is also dealt with, allusion being made to the production of helium and neon from the emanation. A review of the periodic table shows that in two of the groups (6 and 7) inactive elements of the argon group with higher atomic weights than xenon may be expected, and details are given of the recent attempts made by Sir William Ramsay, in conjunction with Prof. Moore, to isolate these two elements. The less volatile residues arising from the fractional distillation of more than 100 tons of liquid air were placed at the disposal of the lecturer by M. Claude. Oxygen, nitrogen, hydrogen, hydrocarbons, carbon monoxide, and water vapour were removed in succession by the usual means, and the residue of inert gases cooled to  $-185^{\circ}\text{C}.$ , and submitted to systematic fractionation. The result of this series of operations was the relatively enormous quantity of 300 c.c. of xenon. This was liquefied at  $-130^{\circ}\text{C}.$ , and again submitted to a methodical fractionation. No trace of any foreign substance could be detected in this xenon, the spectrum of the last third of a cubic centimetre being absolutely identical with that of the bulk. This failure to isolate these heavy gaseous elements from the air may be due to their lack of stability; they may constitute the emanations of radium, thorium, and actinium.

FROM Messrs. Carl Zeiss, Jena, we have received a copy of the third edition of their "Astro. 8" catalogue, a handsomely illustrated volume which should be seen by all those desiring to purchase any kind of instrument or fitting for astronomical use. The present edition, which can be obtained gratis and post-free upon application, has been prepared with the view of meeting all the likely requirements of the scientific amateur astronomer, and includes telescopes and accessories up to an objective clear aperture of  $7\frac{1}{2}$  inches (200 mm.); for larger or special instruments the firm furnishes special estimates. There are several new constructions appearing for the first time in this edition. Among these we notice an ingenious relief system of the hour and declination axes, a changing appliance permitting any accessory to be fitted instantly to the breach of the telescope tube without screwing, and a new sun prism devised by Father A. Colzi, and consisting of a Herschel reflector and a Pickering double-prism; the second prism contains a fluid the depth of colour of which may be chosen to give an agreeable brightness of image. The astro-Tessar and U.V. objectives are also illustrated and quoted, and the catalogue concludes with illustrated specifications of variously sized domes. The London address of the firm is 29 Margaret Street, Regent Street, W.

MR. JOHN MURRAY has published a cheap edition (price 2s. 6d. net) in cloth of Darwin's "Insectivorous Plants."

MESSRS. JOHN WHELDON AND CO., of Great Queen Street, W.C., have just issued a useful catalogue of books dealing with physical sciences.

A NEW edition of their useful illustrated price-list of balances, scales and weights has been issued by Messrs. F. E. Becker and Co., of Hatton Wall, London, E.C. Every form of weighing instrument seems to be represented, and the catalogue includes particulars of a great variety of weights and accessories for use with balances.

MESSRS. JOHN J. GRIFFIN AND SONS, LTD., are prepared to send post free to chemists, teachers of chemistry and others applying for it, a very complete price-list of organic and inorganic chemicals and volumetric solutions manufactured by Mr. C. A. F. Kahlbaum, of Berlin. All the chemical preparations described are included in Messrs. Griffins' London stock.

IN the Journal of the Franklin Institute (vol. clxvi., No. 2) Mr. J. S. Hepburn gives the results of tests of the numerous modifications of the Kjeldahl method for the quantitative determination of nitrogen. The nitrogen content of antipyrin was determined, but in no case was the theoretical percentage of nitrogen obtained. The absolute method of Dumas, however, may be applied to antipyrin with success.

THE report of the Felsted School Scientific Society for the year 1907 provides abundant evidence that good work continues to be done in this school, by the masters and others, to encourage and maintain among the older boys a practical interest in the study of science. The work accomplished during the year is chronicled under botanical, chemical, geographical, and zoological sections. The report of the geographical section includes a fairly complete weather record for the year with which the report deals.

A NEW volume of "The Fauna of British India" has just been published by Messrs. Taylor and Francis. The volume deals with the families Testacellidæ and Zonitidæ of the Indian land mollusca. The late Dr. W. T. Blanford, F.R.S., left a short manuscript in which the shells were dealt with, chiefly from the conchological side, and this formed the foundation of the volume. Lieut.-Colonel Godwin-Austen, F.R.S., who has been responsible for the malacological part, and whose name appears with that of Dr. Blanford upon the title-page, contributes an introduction which should be the means of creating interest in the two important families of Indian land-shells described.

#### OUR ASTRONOMICAL COLUMN.

COMET MOREHOUSE.—The following set of elements and an ephemeris for comet 1908c appear in No. 138 of the Lick Observatory Bulletins. They have been computed by Messrs. Einarsson and Meyer, of the Berkeley Astronomical Department, from observations made at the Yerkes and Lick observatories, and subsequent observations show a satisfactory agreement between the observed and calculated positions. It will be noted that, according to these elements, perihelion will not take place until January 5, whilst the computed increase in brightness is not so rapid as given previously.

##### Elements.

$$\begin{aligned} T &= 1909 \text{ January } 5^{\text{h}} 702 \text{ G.M.T.} \\ \omega &= 152^{\circ} \quad 4' \cdot 0 \\ \Omega &= 90^{\circ} \quad 20' \cdot 5 \\ i &= 135^{\circ} \quad 56' \cdot 2 \\ q &= 1' \cdot 1680 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} 1908 \cdot 0$$

*Ephemeris for Greenwich Mean Midnight.*

1908	$\alpha$ (true) h. m.	$\delta$ (true) °	log $\Delta$	Bright- ness
Oct. 1.5 ...	21 32.4 ...	+72 58.4 ...	0.1249 ...	2.7
2.5 ...	21 18.8 ...	+72 5.0 ...		
3.5 ...	21 6.4 ...	+71 6.9 ...	0.1170 ...	2.9

**LARGE GROUP OF SUN-SPOTS.**—The large group of sun-spots referred to in these columns on August 13, and again on September 10, has again been brought into view by the sun's rotation, this making the third rotation during which the same group has been seen. Its persistent activity is evidenced by the fact that it is once more visible to the naked eye, although the separate spots seem to be somewhat smaller and more scattered.

**THE ORBIT OF  $\zeta$  CANCRI C.**—The measures of  $\zeta$  Cancri made since 1756 are brought together by Prof. Doberck in No. 4273 of the *Astronomische Nachrichten* (September 14), and are supplemented by a few brief notes concerning the orbit of the smaller component (C) of the primary pair.

It will be remembered that this system was the first for which the existence of three components was established, the duplicate character of the larger star of the primary pair being discovered by Herschel in 1781. Subsequent observations showed that the motion of C is very irregular, and led to the suspicion that this star is accompanied by a dark companion. Independent evidence of the existence of this invisible companion is deduced by Prof. Doberck from measures made by Profs. Burnham and Barnard between 1891 and 1905.

He also finds that the star C moves round the centre of gravity of C and D (the dark body) in a circle of 0".158 radius, the period being 17.43 years. Assuming the combined mass of A and B to be equal to that of the sun, it follows that the relative masses of A, B, C, and D are 0.5, 0.5, 0.62, and 0.43 respectively.

**SEARCH-EPHEMERIS FOR COMET TEMPEL<sub>3</sub>-SWIFT.**—A continuation of the ephemeris, published by M. E. Maubant in No. 4269 of the *Astronomische Nachrichten*, for the comet discovered by Tempel in 1869 is given below:—

*Ephemeris 12h. M.T. Paris.*

1908	$\alpha$ h. m.	$\delta$ °	log $r$	log $\Delta$
Sept. 30 ...	7 3.4 ...	+31 3.5 ...	0.0619 ...	9.8396
Oct. 4 ...	7 20.9 ...	+30 16.9 ...	0.0622 ...	9.8411
8 ...	7 37.4 ...	+29 23.7 ...	0.0634 ...	9.8431
12 ...	7 52.8 ...	+28 25.4 ...	0.0655 ...	9.8454
16 ...	8 7.2 ...	+27 23.4 ...	0.0683 ...	9.8478

Three ephemerides are given, that from which the above is taken being computed for the mean date (September 30.88) for perihelion passage. According to the above, the comet should be some 2° S. of Castor on October 6, and about 45' N. of Pollux on October 9.

**THE MANORA OBSERVATORY.**—According to a note published in No. 400 of the *Observatory* (p. 362, September) the Manora Observatory, the instruments of which were recently announced for sale, has been purchased by an anonymous person, who invites observers of all nations to observe with the equatorial.

**A NEBULOUS FIELD IN TAURUS.**—In the September number of the *Bulletin de la Société astronomique de France* (p. 400) Prof. Barnard has an interesting discussion of an extensive nebulosity, which he has photographed, in the constellation Taurus.

A splendid reproduction accompanies the note, and shows the peculiarities discussed. These consist of long dark lanes, in an otherwise nebulous region crowded with stars, apparently devoid of both stars and nebular matter, and Prof. Barnard discusses the hypothesis that their appearance is caused by the interposition of absorbing material between the background of nebula and stars and the earth. He finds this explanation difficult to embrace, but so far is unable to offer a more reasonable one. The field covered by the photograph lies between R.A. 4h. om. to 4h. 34m., and dec. +24° to +28°.5.

*THE ISOTHERMAL LAYER OF THE ATMOSPHERE.*

THE important discussion of which we give here a detailed account was organised by the committee of Section A of the British Association, and took place at the recent meeting.

It was intended that M. L. Teisserenc de Bort should open the discussion, but he was unable to be present, and sent the following communication:—

Permit me to open the discussion on the isothermal layer and the inversions of temperature which are found there by recalling in a few words the results obtained during the past twelve years. Our experiments at Trappes have shown, in the first place, that the temperature ceased to diminish at a certain height after having passed through a point of maximum rate of decrease about 3000 metres lower down.

The altitude at which the diminution ceases changes with the character of the weather; it may descend as low as 8 kilometres at Paris during a cyclone, while it rises as high as 13 or 14 kilometres in high-pressure areas and in front of large cyclones.

I indicated these peculiarities for the first time in October, 1901, in a communication to the Luftschiffahrt Verein at Berlin, then in a communication to the Meteorological Society of France in March, 1902, and I developed these conclusions in a note to the Académie des Sciences in April, 1902.

A short time after, in the early part of May, 1902, Prof. Assmann showed from the ascents of six rubber balloons that not only was there a cessation of the decrease of temperature, but also an inversion. This inversion had also been very marked in the first ascents by Hermite and Besançon, but Prof. Assmann sought to explain it as being due to the effect of solar radiation on the thermometer, while the ventilation produced by the rapid ascent of the balloon showed that it could not be referred to such an error in the thermometer record.

Having once demonstrated the existence of this isothermal layer for places in the neighbourhood of Paris, we sought to find the evidence of it in other regions in order to show that it was a general phenomenon. Ascents made by us and our assistants in the winter of 1900-1, by M. de Quervain in Russia, by Mr. Eggenberger at Bath in England in 1902, have made it evident that the phenomenon was a general one. On referring to the results of the international ascents made in different countries, it is seen that the cessation of the temperature decrease is found in the case of all the balloons sent up, and that it is impossible to refer it to insufficient ventilation, since the phenomenon was well marked in ascents made during the night. Since this time, ascents made on board the *Princesse Alice* by Prof. Hergesell in 1905 have furnished evidence of the existence of the layer near the Azores; ascents made in the United States by Mr. A. L. Rotch have furnished evidence of its existence there with the peculiarities I have indicated, i.e. high up over high-pressure areas and low down over low-pressure areas.

The expeditions of the *Otaria*, organised in conjunction with my friend Mr. Rotch, have proved the existence of the zone in the tropics, and have shown that it is further from the earth near the equatorial regions where the trade winds meet.

Finally, the ascents made at the end of the winters of 1907 and 1908 by the French-Swedish expedition organised by the Observatory of Trappes, with the support of Prof. Hildebrandson, have shown that near the Arctic Circle, at Kiruna, the layer exists and possesses general characteristics analogous with those found in these regions.

The results of series of daily ascents for eight, ten, or more days in succession in February, 1901, March, 1903, and May, 1904, have proved that the change of altitude of the point where the temperature ceases to fall is accompanied by changes of temperature of 10° C., 15° C., 20° C. in an interval of a day or two at heights between 9 and 13 kilometres, variations great enough to be felt near the surface during the same time.

Thus the equalisation of temperature in the course of